WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

removing an oxide film from a surface of the semiconductor film by etching after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating after removing said oxide film.

2. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

removing an oxide film from a surface of the semiconductor film by etching after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating in a reducing atmosphere after removing said oxide film.

3. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

removing an oxide film from a surface of the semiconductor film by etching after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating in an inert gas after removing said oxide film.

4. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

removing an oxide film from a surface of the semiconductor film by etching after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating in an atmosphere after removing said oxide film, a concentration of oxygen or a oxygen compound contained in said atmosphere is 10 ppm or less.

5. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

removing an oxide film from a surface of the semiconductor film by etching after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating in a reducing atmosphere after removing said oxide film, a concentration of oxygen or a oxygen compound contained in said reducing atmosphere is 10 ppm or less.

6. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

removing an oxide film from a surface of the semiconductor film by etching after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating in an inert gas after removing said oxide film, a concentration of oxygen or a oxygen compound contained in said inert gas is 10 ppm or less.

7. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

treating a surface of the semiconductor film with a hydrofluoric acid after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating after the treatment with said hydrofluoric acid.

8. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

treating a surface of the semiconductor film with a hydrofluoric acid after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating after the treatment with said hydrofluoric acid in a reducing atmosphere.

9. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

treating a surface of the semiconductor film with a hydrofluoric acid after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating after the treatment with said hydrofluoric acid in an inert gas.

10. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

treating a surface of the semiconductor film with a hydrofluoric acid after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating after the treatment with said hydrofluoric acid in an atmosphere, a concentration of oxygen or a oxygen compound contained in said atmosphere is 10 ppm or less.

11. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

treating a surface of the semiconductor film with a hydrofluoric acid after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating after the treatment with said hydrofluoric acid in a reducing atmosphere, a concentration of oxygen or a oxygen compound contained in said reducing atmosphere is 10 ppm or less.

12. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film comprising silicon over a substrate;

irradiating said semiconductor film with laser light in air for crystallizing said semiconductor film;

treating a surface of the semiconductor film with a hydrofluoric acid after the irradiation of the laser light; and

leveling the surface of the semiconductor film by heating after the treatment with said hydrofluoric acid in an inert gas, a concentration of oxygen or a oxygen compound contained in said inert gas is 10 ppm or less.

13. A method of manufacturing a semiconductor device according to any one of claims 1-12, wherein the step of leveling the surface of said semiconductor film is conducted by furnace annealing.

14. A method of manufacturing a semiconductor device according to any one of claims 1-12, wherein the step of leveling the surface of said semiconductor film is conducted between 900 and 1200° C.

15. A method of manufacturing a semiconductor device according to any one of claims 3, 6, 9, and 12, wherein said inert gas is nitrogen.

16. A method of manufacturing a semiconductor device according to any one of claims 2, 5, 8, and 11, wherein said reducing atmosphere comprises hydrogen.

17. A method of manufacturing a semiconductor device according to any one of claims 1-12, further comprising a step of treating a surface of the semiconductor film with a buffered hydrofluoric acid before the irradiation of the laser light.

18. A method of manufacturing a semiconductor device according to any one of claims 1-12, wherein said semiconductor device is one selected from the group consisting of a personal computer, a video camera, a goggle-type display, a digital camera, and a projector.